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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,877	11/21/2001	Stylios Derventzis	669-72 (2989.1)	9180

7590 02/09/2005
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EXAMINER

LEE, DAVID J

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/988,877

Applicant(s)

DERVENTZIS ET AL.

Examiner

David Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 38-45 is/are rejected.
- 7) ☒ Claim(s) 11-37 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "200, 202, 204, and 206" have both been used to designate both means in figure 7 and figure 8. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because figure 8 has handwritten labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes

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made to the brief description of the several views of the drawings for consistency.

Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The sections titled "BRIEF DESCRIPTIONS OF THE DRAWINGS" and "DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS" do not mention figure 8.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 39 rejected under 35 U.S.C. 102(b) as being anticipated by Beshai et al. (US Patent No. 6,339,488 B1).

Regarding claim 39, Beshai teaches an optical switch having N switch ports (fig. 1, 18) comprising a switch architecture having K signal delivery matrices (fig. 1, the

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optical core transport network 12 can be considered the signal delivery matrix, where $K=1$) in which any signal received in any one of said N switch ports may be routed through any one of said K signal delivery matrices to any other of said N switch ports (the switching ports can be bidirectional, fig. 1, 28, and col. 5, lines 3-4, and any signal entering any port 18 can be routed through the signal delivery matrix 12 to any other switch port 18).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 6-10, 39, and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ge et al. (US Patent Application Publication US 2002/0018263 A1) in view of Graves et al. (US Patent Application Publication US 2002/0114035).

Regarding claim 1, Ge teaches an optical switch having N switch ports for switching DWDM optical switches (Abstract, lines 1-2), said optical switch comprising: N signal processors (fig. 1, splitters 16 and 51, and combiners 32), including at least one associated with each of said N ports, for splitting and combining optical signals (col. 3, page 3, paragraph 0039, lines 9-11), wherein an optical signal passing in one direction through any one of said bidirectional signal processors is split into K parallel optical signals (col. 3, page 3, paragraph 0039, lines 9-11) and wherein one or more optical

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signals passing through any one of said signal processors in the other direction are emitted as a single optical signal (fig. 1, the splitters 32 each combine the optical signals and each emit a single optical signal), said one direction being oriented into said switch and said other direction being oriented out of said switch (fig. 1, the signals 11 are oriented into the switch and the signals 48 are oriented out of the switch); at least K signal delivery matrices (fig. 1, 18 – space switch block), each of said signal delivery matrices having N matrix ports (fig. 1, the N matrix ports are located at the splitters 16 and 32); and a plurality of signal selectors (fig. 1, 26 and 28, and fig. 2, 53, 58), at least one located between each one of said signal processors (fig. 2, signal selectors are located between signal processors 51 of fig. 1 and 54 of fig. 2) and a respective matrix port to manage the optical signals being broadcast through said switch between said N switch ports by selecting or deselecting one or more signal components from each of said K optical signals (page 3, paragraph 0042, lines 10-14, and page 5, paragraph 0059, lines 2-6).

Ge does not teach that the signal processors and the signal selectors are bidirectional, and consequently, the signal delivery matrices do not broadcast the K optical signals from the N matrix ports to all other N matrix ports. However, Graves, from a similar field of endeavor, discloses a bidirectional switch, where inputs and outputs can be interchangeable (paragraph 0073). It would have been obvious to one of ordinary skill in the art to incorporate bidirectionality in the signal selector and processor as indicated by Graves in the system of Ge in order to allow for more versatility and freedom in the switching process.

Regarding claim 2, the combined invention of Ge and Groves teach that the bidirectional signal processors are passive splitters wherein an optical signal is divided into K informationally identical signals having a power of $1/K$ times an input power less any power loss arising as said optical signals pass through said signal processor (page 3, paragraph 0039, lines 9-11: the divided signals are identical to each other, which means that the total power must be equally divided among the signals as well).

Regarding claim 6, the combined invention of Ge and Groves teach that the bidirectional signal selectors select and deselect predetermined wavelengths (fig. 1, 26 and 28).

Regarding claim 7, the combined invention of Ge and Groves teach that the bidirectional signal selectors include a means for demultiplexing and multiplexing said DWDM optical signals (page 3, paragraph 0029).

Regarding claim 8, the combined invention of Ge and Groves teach a control system for controlling said bidirectional signal selectors (fig. 1, 20, and page 3, paragraph 0038, lines 5-9).

Regarding claim 9, the combined invention of Ge and Groves teach that the control system receives control information from a network (page 3, paragraph 0038, lines 3-5: the data packet's header information is received from a network), and utilizes said control information to control said bidirectional signal selectors (page 3, paragraph 0038, lines 5-9).

Regarding claim 10, the combined invention of Ge and Groves teach that the control information includes information about the wavelength (page 3, paragraph 0038,

lines 3-9: information about the wavelength is needed for header information and for converting the signals to an optical format).

Regarding claim 39, it would have been obvious to utilize a bidirectional signal processor, as stated above in claim 1. Therefore, if the input and output ports are interchangeable, as disclosed by Ge (see claim 1), then it would be obvious that any signal received in any one of N switch ports (fig. 1 of Ge, ports at 16 and 32) may be routed through any one of K signal delivery matrices (fig. 1 of Ge, space switch blocks 18) to any other of N switch ports (fig. 1 of Ge, ports at 16 and 32).

Regarding claim 41, with the consideration that it would have been obvious to incorporate a bidirectional feature in the signal processors, as stated above, the combined invention of Groves and Ge teach a method of switching optical signals through a switch having N switch ports comprising the steps of: a) receiving a signal at one of said N ports (fig. 1 of Ge, ports at 16); and then b) dividing said received signal into K informationally identical signals (fig. 1 of Ge, splitters 16; and then c) selecting or deselecting signal components from one or more of said K like signals (fig. 1 of Ge, broadcast and select switch 26 and 28; d) broadcasting said selected signal components to the other of said N switch ports (fig. 1 of Ge, ports at 32); and f) emitting said signals from said other N switch ports as desired (fig. 1 of Ge, ports at 32 emit signals).

Regarding claim 42, with the consideration that it would have been obvious to incorporate a bidirectional feature in the signal processors as stated above, the combined invention of Groves and Ge teach a method of switching optical signals

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through a switch having N switch ports comprising the steps of: a) receiving a signal at one of said N switch ports (fig. 1 of Ge, ports at 16); and then b) dividing said received signal into K informationally identical signals (fig. 1 of Ge, splitters 16; and then c) selecting or deselecting signal components from one or more of said K like signals (fig. 1 of Ge, broadcast and select switch 26 and 28); and then d) providing said selected signal components to at least one other of said N switch ports (fig. 1 of Ge, the signals from the broadcast and select switches 26 are provided to both ports at each of the ports at each 32); and then e) combining said selected signal components with other selected signal components received at said one other of said N switch ports (fig. 1 of Ge, the combiner 32 combines the selected signal components); and then f) emitting said combined selected signal components from said one other of said N switch ports (fig. 1 of Ge, the combined signal components can be emitted from either of the ports at either combiner 32).

Regarding claim 43, the combined invention of Ge and Groves teach that the N ports simultaneously receive and emit signals (fig. 1 of Ge, it is obvious that the ports at 16 and 32 can be bidirectional as stated above, and therefore the ports can simultaneously receive and emit signals).

Regarding claim 44, the combined invention of Ge and Groves teach a second step of selecting or deselecting signal components at the emitting port (fig. 3 of Ge: the selector 78 can be considered to be the first step of selecting or deselecting components, and the selector 84 can be considered to be the second step of selecting

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or deselecting components). Also, the broadcast and select switch can be considered part of the "emitting port."

8. Claims 3-5, 40 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ge and Groves as applied to claim 1 above, and further in view of Kaminow (US Patent No. 5,077,728).

Regarding claims 3, 4, and 45, the combined invention of Ge and Groves teach all the limitations as applied to claim 1 above, except for the limitation that the bidirectional signal processors are active splitters which include a power amplifier to amplify the signals to have a power similar to the input level. Kaminow discloses an arrangement to amplify signals that have been split to $1/N$ of the input power to have a power similar to the input power (col. 1, lines 31-40). It would have been obvious to amplify signals to full power in order to provide high throughput, and longer range of transmission.

Regarding claim 40, it would have been obvious to utilize a bidirectional signal processor, as stated above in claim 1. Therefore, if the input and output ports are interchangeable, as disclosed by Ge (see claim 1), then it would be obvious that any signal received in any one of N switch ports (fig. 1 of Ge, ports at 16 and 32) may be routed through any one of K signal delivery matrices (fig. 1 of Ge, space switch blocks 18) to any other of N switch ports (fig. 1 of Ge, ports at 16 and 32). In addition, it would have been obvious to amplify signals to the level of the input power, as stated in the above paragraph.

Regarding claim 5, Kaminow teaches that the power amplification is provided by an erbium doped amplifier (fig. 10).

9. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al.

Regarding claim 40, Beshai teaches an optical switch having N switch ports for switching optical signals, said optical switch comprising a switch architecture connecting said N ports (fig. 1, ports at 18) to permit a signal received in one of said N switch ports to be routed to any other of said N ports (any signal entering any port 18 can be routed through the signal delivery matrix 12 to any other switch port 18). Beshai does not expressly disclose an optical amplifier to amplify the signal at a predetermined power but it would have been obvious to include an amplifier in the switch architecture to boost the signals that become attenuated, to amplify the signals to a desired level, and to increase transmission distance.

10. Claims 11-37 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJL


LESLIE PASCAL
PRIMARY EXAMINER